MAY/JUNE 1992

FAA Aviation News

AVIATION SAFETY FROM COVER TO COVER

Home built

page 16

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FAA Aviation news

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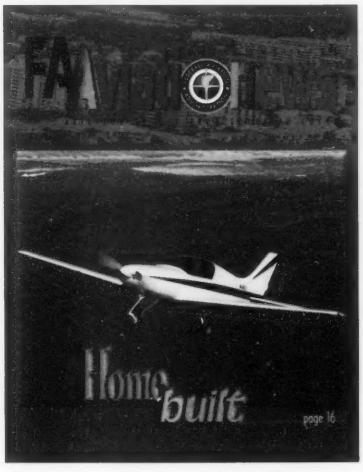
VOLUME 38 · NUMBER 4

FEATURES

1 GPS Status and Vision
4 Safety Within Arm's Reach?
6 There Will Be "Thunder" in the Mountains
9 1998 National Aviation Safety Counselor of the Year
10 Let the CHIPs Fly
12 Diapers, Sewing, and Needle Point: Is this Aviation?
16 Dedication – Perseverance – Confidence
20 Rules and Regulations of Airplane Building

DEPARTMENTS

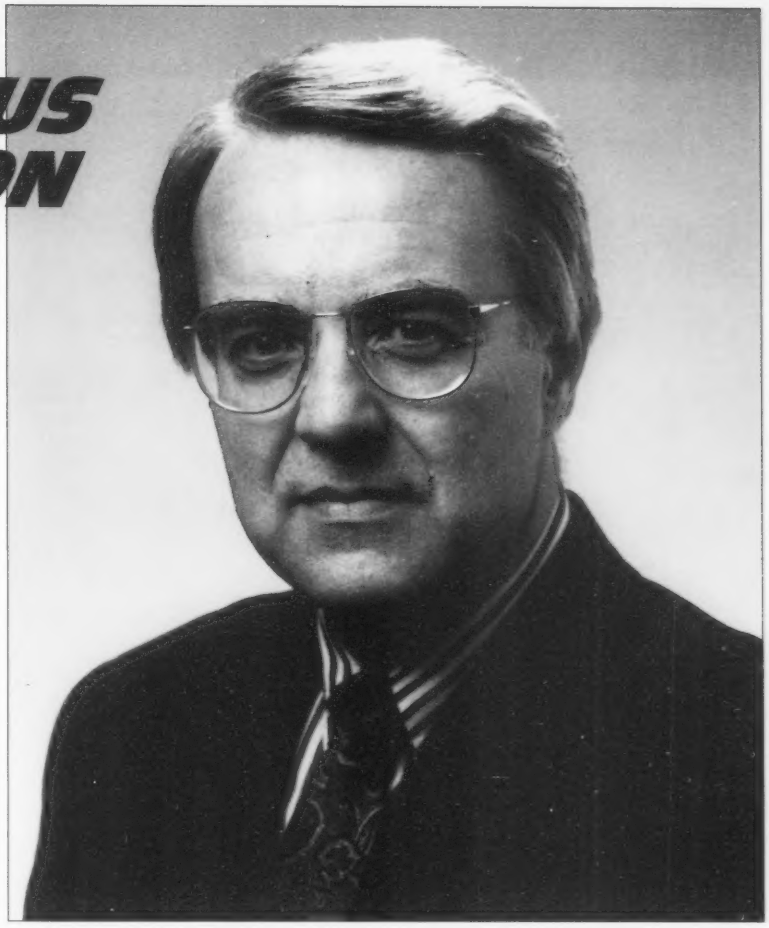
11 Medical Stuff
Are We Too 'Flexible' in Certifying Private Pilots
24 Calendar of Events
25 FlightFORUM
27 AvNEWS
BACK COVER Editor's Runway



FRONT COVER: A home-built Pulsar XP (Gretchen A. Drilling photo)
BACK COVER: A production aircraft (David Clemmer Photo)

GPS STATUS AND VISION

by Thomas E. McSweeny



Mr. McSweeny has been the FAA's Associate Administrator for Regulation and Certification since October 1998.

As we approach the close of the 20th century, the groundwork we are now laying will lead to the future air traffic management system for the 21st Century. Look back 95 years to the Wright Brothers first flight; think about the progress that has been made from that event to today.

In one hundred years, I am confident that the systems we are developing now will be the backbone and the framework for the systems of the 22nd Century. That is why I believe that satellite technology is the most important technological breakthrough in civil aviation navigation since radar was introduced over 50 years ago.

I'd like to share with you a little about what the FAA and others are doing in support of its commitment to Global Navigation Satellite System (GNSS). I'd also like to discuss some of the challenges that we face, as well as talk about a few new air traffic management initiatives that we have underway.

GPS

Satellite technology is already in use in the United States and elsewhere as a navigation aid for en route, oceanic, and remote airspace, and also for non-precision approaches. The U.S. Global Positioning System (GPS) provides this service as part of the Global Navigation Satellite System (GNSS), which also includes the Russian GLONASS system (*a complementary, not competing, system*).

GNSS, with developments underway today, will provide even greater safety benefits by making precision approaches possible at thousands of airports worldwide, where no such capability exists today. These benefits will be especially significant in many developing countries where the ground-based navigation aids needed to support safe civil aviation operations are limited or even non-existent.

Additionally, we believe GNSS will bring about crucial capacity enhancements that will help meet the growing worldwide demand for air transport services well into the next century.

Ensuring the use of satellite technology by aviation is a high priority for the FAA, and, as aviation is inherently an international endeavor, we are committed to working cooperatively with our international partners to develop a seamless global navigation satellite system.

U.S. GPS Operations

The use of GPS in en route, oceanic, and remote airspace, as well as for non-precision approaches, has already improved safety in U.S. airspace. The introduction of new, straight-in approach procedures has reduced the need for procedure turns and circling approaches. GPS provides a very reliable and accurate navigation system that dramatically improves safety over an NDB approach or a VOR approach when the VOR is not collocated with the runway. GPS has also improved safety for en route navigation, providing service at low altitudes where no navigation service previously existed due to line-of-sight limitations associated with ground-based navaids. Oceanic operations have been made safer by replacing Omega navigation with GPS. I encourage all Member States to review the ICAO Circular on early implementation of GNSS and take advantage of the safety improvements that are available today.

At the last ICAO General Assembly in September, FAA Administrator Jane Garvey reiterated the FAA's commit-

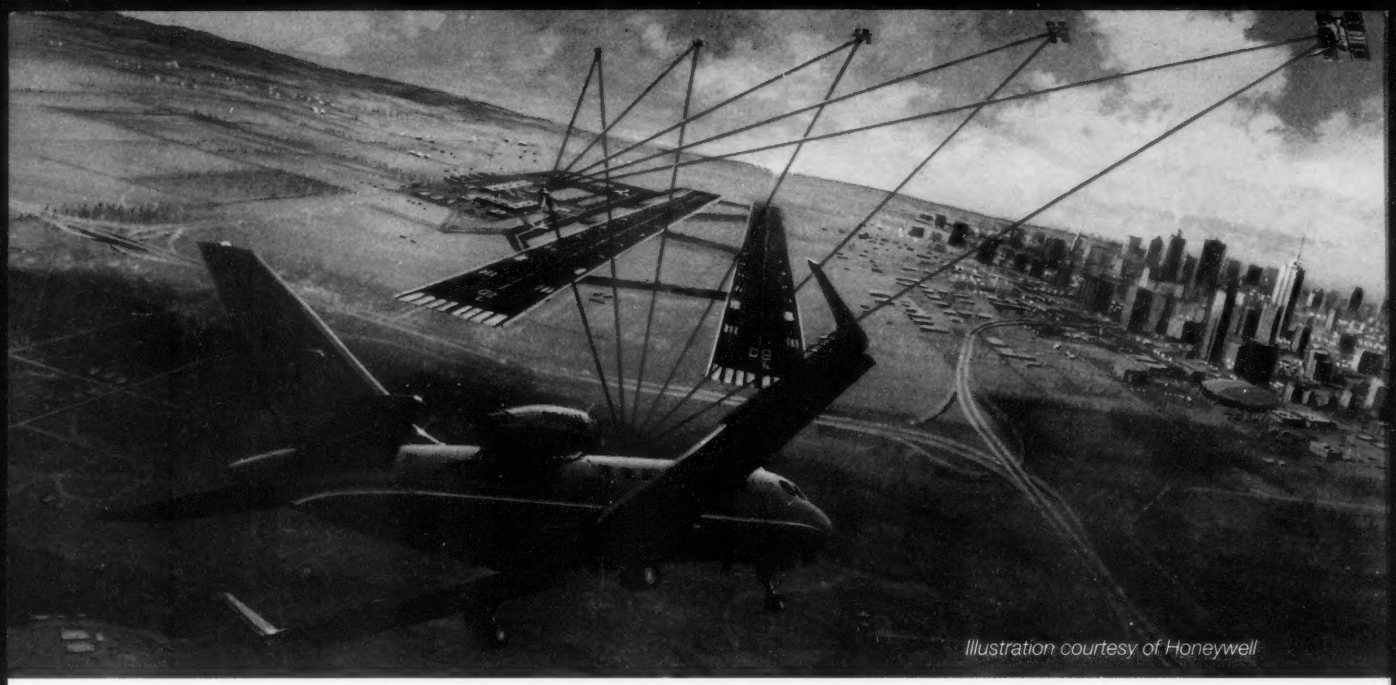


Illustration courtesy of Honeywell

ment to pursuing GPS and its augmentations, and she invited, once again, any Member State desiring to use GPS for its own operations to do so without charge.

WAAS

Today's GPS system, however, does not meet the high standards of accuracy, integrity, and availability required for precision approaches and landings. As a result, the FAA is developing two augmentation systems to improve the capabilities of GPS.

The Wide Area Augmentation System (WAAS) is one of the cornerstones of the modernization of the U.S. air traffic management system. Combined with GPS, it will provide users with capabilities from en route navigation through Category I precision approaches. The WAAS network of geostationary satellites and 25 ground stations, which have already been installed, will augment the basic GPS signal to provide the accuracy, integrity, and availability that is crucial to civil aviation operations. This year alone, the FAA is spending over $85M on this program to deliver this capability.

As many of you are aware, the Administrator announced in January that implementation of the WAAS program would be delayed approximately 14 months. The delay will allow more time to complete development of a critical software safety package that monitors, corrects, and verifies the performance of the WAAS. The FAA will not commission Phase I of WAAS until we are satisfied that the system is safe and all problems have been resolved. We believe this is a smart, prudent approach to developing a technology that is key to the operational safety and efficiency of our National Airspace System, as well as of the global system.

LAAS

The second GPS augmentation system, the Local Area Augmentation System (LAAS), is ground-based and will be used to support Category I, II, and III approaches and landings.

LAAS equipment, located on or near an airport, will augment GPS within 30 miles of the airport. It could also be used for other terminal activities including high-speed turn-offs and surface operations, missed approaches, departures, and vertical take-offs.

At this time, the LAAS program is in the process of establishing government and industry partnerships to develop the LAAS to support Category I/II/III precision approach and landing operations.

Environmental benefits may arise from GNSS as well. By facilitating more precise, targeted approaches, use of GNSS could lead to less fuel consumption and reduced aircraft noise over noise sensitive areas.

GPS Modernization

Further evidence of our commitment to advancing GNSS can be found in Vice President Gore's announcement in January of a $400 million initiative to modernize GPS. The new funding will allow the addition of two new civil signals to future GPS satellites, which will significantly enhance the service provided to civil, commercial, and scientific users. In response to the ICAO recommendation, one signal will be in the aeronautical safety-of-life band currently used by DME and ACAS.

"Sole Means"

One challenge that we all face is the "sole means" issue. Last summer, to make sure that the path we were following was smart and sensible, we supported an aviation industry initiative for an independent study. This study was carried out by the highly respected Johns Hopkins University Applied Physics Laboratory of Maryland. Their charge was to look at the risks associated with GPS and determine if augmented GPS could be the only navigation system in an aircraft (i.e., "sole-means") and the only navigation service that the FAA

provides (i.e., "sole-service").

This study was co-sponsored by the Aircraft Owners and Pilots Association (AOPA) which represents general aviation pilots and the Air Transport Association (ATA) which represents leading airlines. Its member carriers transport over 95% of all passenger and cargo traffic in the United States.

At the end of January, we received the results of the six-month risk assessment. The report affirmed that augmented GPS can "satisfy the performance requirements to be the only navigation system installed in an aircraft and the only service provided by the FAA for operations anywhere in the National Airspace System."

Risks to GPS from natural, manmade, and hostile radio interference were all judged to be manageable. "Technologies are emerging that can greatly reduce vulnerability to GPS signal jamming," the study said. We continue to evaluate the effects of jamming and the interference issues in cooperation with the international community.

We are encouraged by the Johns Hopkins risk assessment; the FAA remains committed to delivering sole-means GNSS. We are developing an action plan to address all of the issues and recommendations that have been raised by the study.

Augmentation systems like WAAS and LAAS will enable GPS to be used as a "sole means" system of navigation. For purposes of clarity, the FAA uses the term "sole means" as defined in ICAO Circular 267, which refers to the navigation equipment on an aircraft and signifies that GNSS equipment will be the only navigation equipment required on board an aircraft to support a particular operation or phase of flight. GPS, with proper augmentation, is designed to be used as a "sole-means" system and the U.S. is committed to achieving this goal.

This differs from the concept of "sole service," which refers to the provision of GNSS as the only radio-navigation service in a region or for an operation. In most U.S. airspace, this will involve the decommissioning of existing ground-based navigation services such as VOR and ILS.

The pace and extent of user transition to augmented GPS as "sole-service" navigation depends on numerous factors, all centering on system performance and user acceptance. These factors include benefits from GNSS, avionics costs, satellite availability, and the reliability of systems designed to overcome the risks associated with jamming and unintentional interference from the atmosphere and other sources.

The decommissioning schedule is predominantly a transition issue: We must decide how long users will have to equip with new services before older services are withdrawn, and we must decide which ground-based services will be retained the longest. This transition cannot happen overnight, and will be driven by operational experience and user acceptance. While the FAA plans to decommission the majority of ground-based navigation aids--*over time and with much thought about safety as our paramount concern* --GNSS may not become the "sole-service" means of navigation in some congested airspace-at least in the near future. This does not diminish our commitment to making GNSS a "sole-means" system, through augmentation by WAAS and LAAS. To validate this commitment, we are conducting a refined investment analysis to determine the most cost-effective combination of satellite-based navigation services.

User Support

Despite these challenges, the FAA is committed to the implementation of WAAS and is heartened by the support of U.S. system users. Carol Hallett, President of the Air Transport Association, has said that the Johns Hopkins study "clearly shows that, with the proper investment and augmentation, GPS will become the navigation system for the 21st century."

The U.S. General Aviation community is solidly behind GPS. Phil Boyer, President of the Aircraft Owners and Pilots Association (AOPA) stated recently, "This is cutting-edge technology. We're willing to accept some delay to ensure that GPS/WAAS is completely proven and reliable." AOPA represents over 340,000 members who own 75% of the 190,000 non-airline aircraft in the U.S.

International

Our domestic efforts to deploy systems to take advantage of GPS are not undertaken in a vacuum. Cooperation with our international partners in applying satellite technologies to aviation is important, both globally and nationally, in order for all of us to fully enjoy the benefits of GNSS.

To ensure that WAAS and LAAS are interoperable with other systems, we have been working closely with ICAO, through the GNSS Panel, to develop standards and recommended practices (SARP) relative to satellite navigation. We look forward to the GNSS Panel approving the SARP this April. We have also been cooperating with the other providers of space-based augmentation systems (SBAS) on system implementation and have been working directly with other nations on GPS implementation and demonstration of augmented GPS performance. We plan to continue these efforts to ensure that we implement a seamless, global area navigation system.

Conclusion

I know that just as radar revolutionized aviation 50 years ago, GNSS will dramatically alter aviation in the next century. Close cooperation among international partners will enable us to overcome these challenges, bring to operation these new technologies and procedures, and begin thinking about the next revolutionary breakthrough for aviation in the 21st century.

The preceding was given as a speech by Mr. McSweeny at a recent International Civil Aviation Organization (ICAO) meeting. Mr. McSweeny is the FAA's Associate Administrator for Regulation and Certification.

Safety
Within Arm's Reach?

by H. Dean Chamberlain

Some days being on a magazine staff is difficult, if not down right tough. The problem is we started working on the Spring-time articles two weeks before Christmas, and it is hard to talk about safety over the holidays when this article will not be used until after March. Plus I don't know how to ask Santa Claus for some of the following gift ideas. Then by the time this article is published, the gifts you gave have been delivered and the bills have started to come in, and it is too late to ask for or buy some of the following "pilot toys" if they were not on your gift list.

Two things happened this week that we want to share with our readers that involve "pilot toys." Although I call them toys, they offer some very serious safety advantages, and, yes, like everything in aviation, they are somewhat expensive.

The first thing that caught my attention this week involved an article I read in the latest Soaring Society Association's Soaring magazine about a sailplane pilot that was involved in a very serious accident. The pilot received many, very serious injuries. According to the author, the medical people who treated the pilot said that if the pilot hadn't been in such good physical condition he probably would have died in the crash. In addition to his great physical conditioning, several things helped save the pilot. One was the pilot himself. Although laying in the cockpit with multiple breaks of his neck and with a broken back among other injuries, the pilot, once he regained consciousness, was able to reach his cellular telephone and call for help. Other factors contributing to his rescue were that other people had witnessed the crash, and they were also able to call for help. Another pilot was able to fly over the crash site and helped rescuers locate the crash site. All told, the pilot was lucky. He survived the crash, and help got to him very quickly.

But I think the author made a very good point in his article when he commented on the fact the pilot was able to reach his own cellular telephone and call for help. The author, like many of us that fly with a cellular telephone in our flight gear, said he kept his cellular telephone stored in the back of his sailplane in case he had to land off airport. He said he did not expect to have to be able to reach it in an emergency to call for help.

The fact that the pilot involved in the accident was able to call for help as part of his own rescue we think is an important safety reminder for all pilots. If you carry a cellular telephone or a handheld aviation transceiver, or both, can you reach one in the event you have to do it in the aircraft whether in flight or after a crash? Whether you have an electrical failure and have to get in contact with air traffic control or you are involved in a survivable accident, can you reach your telephone or radio while you are strapped in your seat? The same is true of survival equipment. It is something to think about. You may not be able to move more than your arm. If you can't reach something, it is as good as not there.

A word of caution though. Whenever operating any type of signaling device around an aircraft crash site, you must always make sure there is no risk of an explosion because of fuel spillage around the crash site. It doesn't do you any good to survive the crash just to die in the ensuing explosion and fire, especially a fire you caused yourself.

Please also remember that the Federal Communications Commission regulations prohibit the use of cellular telephones in flight. The reason is cellular telephones are designed to only activate the appropriate receiver within a designated "cellular" area. At flight levels, the telephone could disrupt a wide area of cellular operation. But in a life-threatening emergency, you just may want to use your telephone.

MORE TOYS

The FAA participates in a Federal Government Interagency Committee on Search and Rescue Research and Development Working Group (ICSAR R&D WG). The ICSAR R&D WG is a subcommittee of the Government's full ICSAR that represents those Federal Government agencies with a national search and rescue (SAR) responsibility. One benefit of representing the FAA on the ICSAR R&D WG is the opportunity to see and hear about new search and rescue technology. Which brings us to the newest pilot "toys." I wish Santa would have thought to bring me some of these items for Christmas.

First the small print. Whenever FAA discusses a new product, FAA has to be very careful not to imply endorsement for any particular company's products. But at the most recent ICSAR R&D WG meeting, two products were demonstrated that have a potential SAR value.

The first product was a handheld satellite GPS communicator. The unit allows data communication via low-earth orbit (LEO) satellites anywhere in the world. Since each unit has its own email address, you can send

and receive email messages around the world. The company that offers the service is ORBCOMM which uses a commercial Magellan satellite receiver. In addition to email messages, ORBCOMM offers a voice relay service that customers can subscribe to that uses human operators to relay messages to anywhere in the world with telephone service. Subscribers to the service can also call in for any stored messages. The voice service is designed for those messages where someone may not have access to their email account. In that case an operator will try to call and relay the message. Since the satellite communicator has built in GPS capability, it can also send your present position to anywhere in the world you want it delivered by email. So say for example, you make an emergency off-airport landing out in the back country, you can communicate your position and intentions by satellite to your home or anyone with email access or using the telephone service to anyone with a telephone. And since the communicator is two-way, they can also send you messages. Now think how convenient such a system would be in a crash in the outback. Now you can see the potential for such a system. Now when you go beyond cellular telephone service range or even beyond line of sight range of a radio, you can still communicate by satellite.

In addition to the ORBCOMM service, there are small portable satellite telephone systems in operation as well. So, if you haven't been reading the trade publications, there are some great ways to communicate today using satellites.

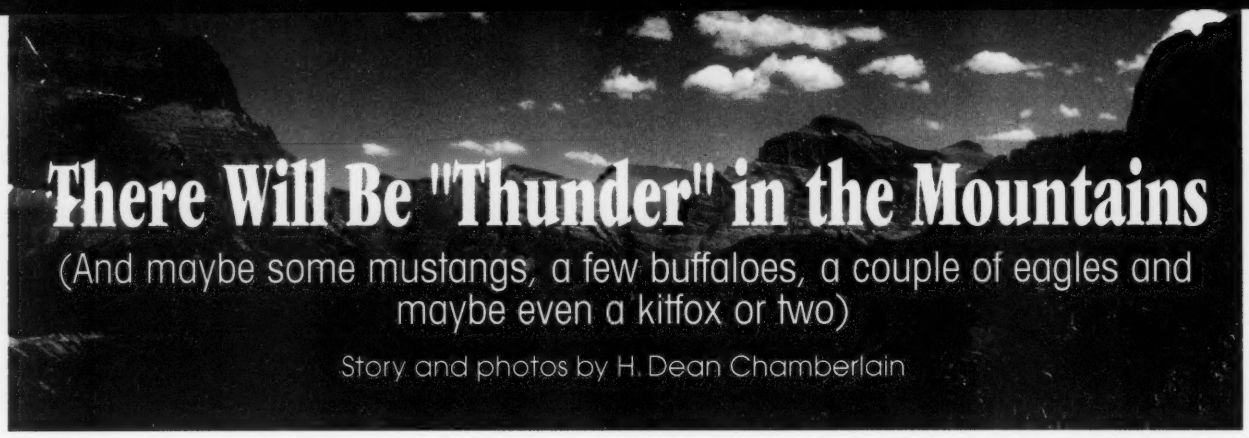
Another way to communicate using satellites is by having a cockpit data link such as that developed by ECHO FLIGHT that uses the ORBCOMM satellite system of LEO's in partnership with ORBCOMM to provide data link information to general aviation (GA) aircraft. Although the airlines and large corporate aircraft have had such systems for years, technology now is permitting small GA to install such systems for the price of only several thousand dollars. The service can provide near (not) real time weather radar maps from the National Weather Service, as well as real time tracking of your aircraft using a built-in GPS engine.

Each data link receiver has a built in email address so messages can be sent to your specific aircraft. With the right equipment, your aircraft can be tracked from takeoff to landing. The system also permits the selective message of specific flight parameters.

In the case of an accident, it is possible for someone to know your location within the accuracy of the GPS unit virtually anywhere in the world. There may be some areas in the world without complete satellite viewing, but those areas are being reduced as more satellites are launched.

These two services, satellite communication and satellite-based GA cockpit data link, have the potential to reduce the SAR response time as well as making life easier for those that fly. Add in your cellular telephone, a handheld aircraft transceiver, a 406 MHz emergency locator transmitter, and you have the ingredients to make being lost virtually impossible anywhere in the world.

Aren't toys grand?



There Will Be "Thunder" in the Mountains

(And maybe some mustangs, a few buffaloes, a couple of eagles and maybe even a kitfox or two)

Story and photos by H. Dean Chamberlain

Mark your calendar. The dates for your next chance to get some hands-on experience with some real mountain flying and spend some classroom time learning how to fly safely both in and out of the Northwest mountain area is rapidly approaching. The 13th annual Northwest Mountain Family Fly-In and Aviation Safety Conference is scheduled for July 16, 17, and 18 in West Yellowstone, Montana. The Fly-In is being held at a new "old" location this year. The reason we say new "old" location is because the first Northwest Mountain Family Fly-In was held in West Yellowstone in July 1987.

To get to West Yellowstone, pilots with GPS or LORAN-C units need to program their units for Yellowstone (WYS) airport. You just have to watch out for any mountains en route. For pilots without GPS or LORAN-C, you may have to navigate the old fashion way. The time-proven "IFR" technique of "I follow roads" might be a good way to get there. Regardless of how you get there, when you combine a beautiful Northwest mountain setting with some exciting new kit aircraft, add in some classic older aircraft, sprinkle in some great safety seminars, stir up some good food, add a dash of friendship, and toss in an opportunity to visit some spectacular outdoor sites such as Yellowstone National Park, you have the makings for a fun-filled aviation safety weekend. The chance to win a couple of great door prizes such as a GPS unit and other prizes just adds to the fun.

Aviation Support for the Fly-In

This year promises to the best Family Fly-In yet. According to Jim Cooney, the Helena MT Flight Standards District Office Safety Program Manager, the Experimental Aircraft Association (EAA) will play a major role in this year's Fly-In. The EAA will hold a trade show at the Holiday Inn Conference Center in West Yellowstone with up to 50 display booths. In addition to the EAA trade show exhibits from 25 to 30 kit plane manufacturers plan to attend the Fly-In to display their latest kit aircraft.

Several major kit manufacturers have already committed to attending the Fly-In. One of those kit aircraft will be the Thunder Mustang. Others include the Lancair, Stoddard Hamilton Glass Air III, the Vans Aircraft RV-8, Christen Eagle, Pitts S2C, Murphy Rebel, and perennial favorite, the *Kitfox.*

As this article was being written, Cooney said he expects antique aircraft owners, home aircraft builders, and warbird lovers from a seven-state area to converge on West Yellowstone for the Fly-In. "If you are a member of such a group and want to coordinate your group's participation in the Fly-In, you should contact John Goostrey, the Boise FSDO Safety Program Manager, at 1-800-453-0001," he said.

FAA Support for Fly-In

Each year, the FAA's Northwest Mountain Region's Helena (MT) FSDO and the Boise (ID) FSDO safety program managers with the total support of their respective offices coordinate a family style fly-in extravaganza somewhere within the Montana-Idaho area. Working with the help and support of other FAA organizations within the Northwest Mountain Region that includes air traffic control, other FSDO's, the Regional Headquarters, the Montana Aeronautics Division, the Idaho Aeronautics Division, and with the help of dedicated local and state aviation enthusiasts and organizations all working together, the Safety Program Managers help produce a Fly-In that is not only fun, but one that is also educational and designed to help keep safety in aviation.

Last year the Fly-In was held in Kalispell MT. The previous two years, the Fly-In was held at the Teton Peaks/Driggs ID airport.

Fly-In is Unique

What makes this Fly-In unique?

First, the Northwest Mountain Family Fly-In is designed for the whole family. It is not just for the aviation enthusiast. Although the Fly-In offers some great training and safety seminars, the FAA and state and local sponsors work hard to select a location that offers something for every member of the family. Included in this year's schedule is a Friday evening barbecue and a Saturday night banquet with guest speaker noted civilian free lance professional test pilot and flyer Mr. Dave Morss of Redwood City, CA. Each afternoon throughout the Fly-In some of the best aviation experts available will be sharing their knowledge on such safety topics as mountain flying, medical issues, aircraft systems, flight operations, and other subjects of interest to pilots and aircraft owners.

Fly-In Safety Programs and History

For those who like a challenge there are such pilot skills tests as flight checks with volunteer flight instructors

and FAA aviation safety inspectors. For those who think they can preflight an aircraft and find any and all discrepancies, they can test their skills on a "preflight aircraft" that might have one or two challenges hiding somewhere on it. For more information, please see the following schedule of events for more details on these two as well as other interesting activities at the Fly-In. Although subject to last minute changes, the Fly-In events promise to challenge everyone.

Second, to keep the event "fresh" and to fair-share the opportunity for local airports and aviation groups to participate and sponsor the annual Fly-In, the two Safety Program Manager coordinators frequently move the location of the Fly-In every year or two throughout the Montana and Idaho area.

Third, the Montana Aeronautics Division, Idaho Aeronautics Division, hosting community, and the various national, state, and local aviation groups that participate all work with the FAA to support the Fly-In. The fact this is the 13th annual Fly-In is proof they know how to put on a successful fly-in.

And finally, the two FSDO's always try to host the Fly-In at an airport in a community that can offer some great outdoor recreational activities for those who want to combine a mini-vacation with the Fly-In by arriving early and leaving after the event. This year is no different. From mountain rivers and lakes that offer some great fishing and whitewater rafting to the world-famous Yellowstone National Park, the Yellowstone area offers something for everyone. From horseback riding to boating to visiting the park, the choice is yours. Old Faithful is only 30 miles away.

West Yellowstone Airport

The West Yellowstone (WYS) airport which is owned and operated by the Montana Aeronautics Division, is located about one nautical mile north of the town of West Yellowstone, Montana. The 8,399 foot-long asphalt runway can handle most general aviation aircraft. The airport is on the Great Falls sectional chart and the L-9C IFR chart. Additional operational information can be found in the Northwest U.S. *Airport/Facility Directory* (NW54) on page 69. For pilots new to the area, the airport elevation is 6,644 feet. "Low-land" pilots need to review their high altitude and mountain flying techniques. All pilots should review their aircraft's density altitude performance data.

Transportation will be provided between the airport and the Holiday Inn Convention Center in West Yellowstone. During the Fly-In, airport activities will be held in the mornings with seminars held in the afternoon at the Holiday Inn.

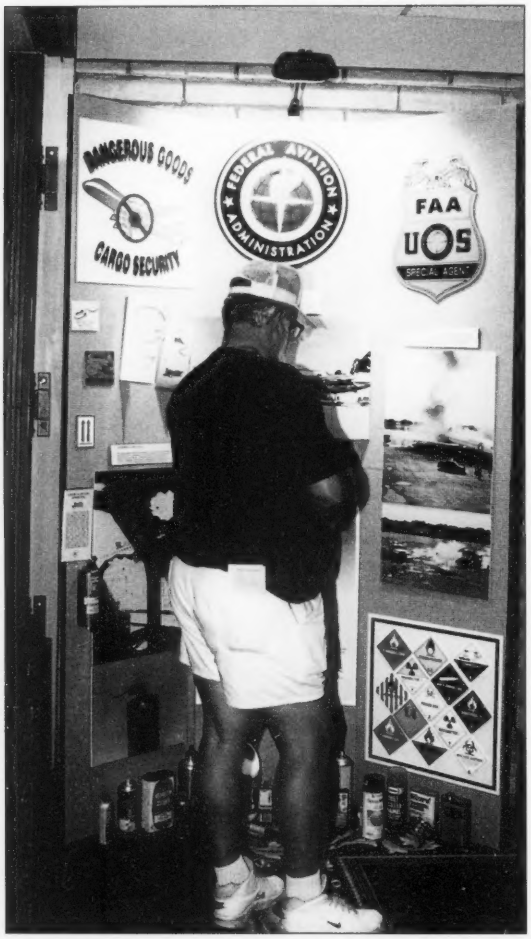
FAA "WINGS" Weekend Sets the PACE

The Fly-In qualifies as an FAA "WINGS" weekend. As part of the Fly-In, aircraft owners can request that their aircraft be given a courtesy safety inspection. This is conducted under the PACE (Pilot and Aircraft Courtesy Evaluation) program. FAA airworthiness inspectors will perform a voluntary inspection of the aircraft and check such things as the aircraft's paperwork and logbooks, status of compliance will all applicable airworthiness directives, and perform an abbreviated airworthiness inspection of the aircraft.

The FAA will arrange for local aviation maintenance technicians to be on hand in case a serious airworthiness problem is discovered. Hopefully, none will be discovered, but help is available just in case.

Following the airworthiness inspection, the aircraft owner can take a

courtesy evaluation flight with an FAA operations inspector who will comment on the pilot's flight skills. The intent of the flight is to evaluate the flying skills of the pilot and if certain skills are found to be weak, the inspector will recommend possible additional training for the pilot. Both the airworthiness inspection and the pilot flight evaluation are not "formal" FAA inspections. They are courtesy inspections designed to identify a potential problem before it can become serious.



Pilots who complete three one-hour free proficiency flights as outlined in FAA Advisory Circular (AC) 61-91H, Pilot Proficiency Award Program, with one of the volunteer certificated flight instructors at the Fly-In during the weekend and who attend one of the aviation safety seminar presentations over the weekend can earn a phase of the FAA's Aviation Safety Program's "WINGS." Completion of a "WINGS" phase can be used in lieu of a flight review to meet the requirements of FAR § 61.56, Flight Review. Subparagraph FAR § 61.56(e) is the reference. Attending a safety seminar is easy because throughout the weekend there are revolving safety seminars being held throughout the Fly-In each afternoon.

Helena FSDO's Internet Website

Anyone planning on attending the Fly-In can find motel and other important safety information on the Helena FSDO's Internet website. The FSDO's website Internet address is *http://www.faa.gov/fsdo/hln* Included on the website is additional links to some of the kit aircraft builders expected to attend the Fly-In. Information is also available from the West Yellowstone Chamber of Commerce at 406-646-7701. If you are planning on making motel reservations, it is recommended that you make them early. When making your reservations, you need to identify yourself as a Fly-In participant to receive any special discounts for Fly-In attendees. As in the past, some pilots and their families chose to camp out under the wing of their aircraft. The choice is yours to camp out or to camp in. But if you want to "camp" in one of the motels, you might want to reserve your room now if you have not already done so.

Mountain Flying Cautions

For those pilots not familiar with the Yellowstone area, you may want to check the Helena FSDO's website for information about mountain flying techniques and related links to other aviation websites.

Pilots need to remember, though, that reading about mountain flying is no substitute for professional instruction from an appropriately rated flight instructor familiar with the area in which you will be flying, and who is also familiar with your particular aircraft and its operating limitations.

The 13th Northwest Mountain Family Fly-In will include free dual instruction from volunteer FAA certificated flight instructors for those pilots interested in taking advantage of the chance to get some local dual flight instruction. So, stop on by and enjoy the chance to add to both your flying knowledge and flight skills. You will be glad you did. Have a safe trip.

1998 National Aviation Safety Counselor of the Year

By Jim Porter

Mr. Michael T. Vivion, a volunteer Aviation Safety Counselor for the Fairbanks (Alaska) Flight Standards District Office, has been selected as the FAA's 1998 National Aviation Safety Counselor of the Year. Mike is the fourth aviation safety counselor to receive this award since its inception in 1994. Roger Baker, the FAA's National Safety Program Manager, presented the award to Vivion on March 13th at the annual awards banquet during the Fairbanks Spring Air Fair Expo - Safe 99.

Vivion is extremely active as an Aviation Safety Counselor for the Fairbanks Aviation Safety Program. He has made safety videos with the Alaska Aviation Safety Foundation and written many articles on aviation safety.

Vivion has participated on several aviation user group committees. He has been the Vice Chairman of the Alaskan Aviation Safety Foundation, the Northern Alaska Field Director for the Seaplane Pilots Association, co-chairman of the Civilian and Military Airspace Committee (CMAC), and he is an active member of the Northern Alaska Certified Flight Instructor Association.

Vivion's volunteerism extends to writing articles for aviation safety publications. He is the author of aviation safety articles in the Seaplane Pilots Association's *Water Flying*. His reputation as a knowledgeable and safety conscious aviator makes him a valued speaker at aviation safety seminars. He has spoken on such diverse topics as seaplane safety, safe operating techniques, and weather flying by the VFR pilot. He also spoken at the national Aircraft Owners and Pilots Association convention about passenger safety. He works to promote aviation safety through education and information

In addition to his duties as a volunteer Aviation Safety Counselor, Vivion is a Wildlife Biologist/Pilot with the U.S. Fish and Wildlife Service.

Michael T. Vivion

Aviation Safety Counselors are private individuals dedicated to the promotion of aviation safety. They voluntarily serve as assistants to the Safety Program Managers in the various FAA FSDO's. They support the Aviation Safety Program by providing advice and safety information to their fellow airmen, by arranging and participating in aviation safety educational seminars, and promoting aviation safety in many other ways in their local communities. They are the backbone and the energy of the Aviation Safety Program. At the present, we have 4,000+ volunteer Safety Counselors nationwide.

Mr. Porter is the Operations Safety Program Manager at the Fairbanks, Alaska Flight Standards District Office.

Let the CHIPs Fly

by Kenneth J. Filippelli

On February 23-25, 36 Aviation Safety Inspectors from around the country gathered in New Mexico to attend the 1999 Cargo Hauling, Inspection, and Procedures Workshop (CHIP 99). This 2 1/2 day workshop was held at the FAA Airworthiness Assurance NDI Validation Center (FAA/AANC) in Albuquerque. The workshop was hosted by the Airworthiness Programs Branch (AFS-610) in Oklahoma City. Inspectors came from as far as Alaska, Hawaii, and the East coast to learn about the inspection techniques and compliance requirements for the Boeing 727/737 Supplemental Structural Inspection Document (SSID) and cargo floor loading Airworthiness Directives (AD).

Subjects discussed at the workshop focused on several areas of interest to cargo operators. They are of particular concern to those operators with Boeing 727 freighters which have been converted from passenger aircraft under a Supplemental Type Certificate (STC). Some of the topics also held interest to Boeing 737 operators because of the structural similarity between the two airplane models.

There have been a number of incidents and accidents involving cargo airplanes because of the inadvertent opening of cargo doors during flight and the subsequent loss of cargo restraint. The affected airplanes had been modified from passenger to cargo configurations under an STC. FAA investigations into the causes of the incidents revealed deficiencies in both the design and the installation of the STC modifications. Although the occurrences were not limited to Boeing 727 airplanes, the workshop discussions focused mainly on that model airplane. The deficiencies found were related to negative safety margins of the modified structures and systems, inadequate drawing definition and the lack of adherence to drawings during the modification, a lack of instructions for ensuring continued airworthiness of the modification, and the incompatibility of the cargo conversion with other modifications and repairs to the airplane.

The workshop featured presentations on cargo operation safety, legal impact of the AD, different methods of non-destructive inspections, what constitutes structurally significant items, inspection techniques for determining the integrity and airworthiness of existing repairs, a hands-on exercise on how to complete a damage tolerance report, and cargo floor loading issues (including weight and balance concerns).

Various aircraft and displays were available at the AANC facility for inspectors who wished to see specific examples of SSIs and repairs.

Overall, the information presented in the workshop was well received by the inspectors and a good interchange of ideas and information took place. The various discussions sparked a lot of interaction between the attendees and the presenters. Not only was much needed information provided to inspectors working daily with the cargo operators, but many of their concerns and much of their insight was also relayed back to the engineering and regulatory groups in the FAA. Several of the inspectors have expressed interest in continuing these workshops and expanding them to include representatives from the cargo operators. This idea is still under consideration.

Accidents involving cargo-only aircraft are not usually "headline grabbers" because large numbers of people are not casualties. However, the FAA approaches the inspection and surveillance of cargo operators with safety as the top concern. The training provided by CHIP 99 was a perfect example of FAA professionals who are dedicated to safer skies. Once again, the FAA enthusiasm and concern for safe aviation was demonstrated by the cooperation of the Continued Airworthiness Maintenance Division (AFS-300), the William J. Hughes Technical Center, AANC, the Transport Airplane Directorate, the Seattle ACO and the Portland FSDO who provided the knowledgeable presenters; the Aircraft Certification Service who facilitated the meeting; and the inspectors who made the workshop a success.

Are We Too 'Flexible' in Certifying Private Pilots?

by Jon L. Jordan, MD, JD

Over the past several years, there has been a growing interest throughout the world in FAA's airman medical certification practices and philosophies. One philosophy that some persons question, including a few of our own aviation medical examiners, relates to our greater flexibility in granting special issuances to private pilots as opposed to air carrier and other commercial pilots.

The arguments against such flexibility rotate around the thought that, in the event of a medical incapacitation, an air carrier or commercial pilot usually has another pilot on board who can take control of the aircraft and safely land. In contrast, the private pilot often has no such "safety net" and, therefore, a medical incapacitation is likely to have severe safety consequences. It is argued that this means we should be more conservative when it comes to granting special issuances to private pilots. I have difficulty accepting this argument.

In the case of an air carrier or other commercial pilot, the highest level of safety should be our goal -- this is to best protect the fare-paying passenger who, in my belief, is entitled to as safe a journey as can reasonably be made. While it is true that most medical incapacitations involving a two-member crew do not result in aircraft accidents, the margin of safety, should an incapacitation occur, is too narrow to take a significant risk.

In the case of the private pilot, I think we can be more flexible and allow that pilot to assume some risks for him or herself that we would not permit in air carrier or other commercial operations. We have exercised this philosophy since the very early days of the regulation of civil aviation, and the concept is clearly embedded in our current medical standards.

This philosophy is frequently challenged regarding the safety of persons who fly as invitees of the private pilot. My response is that these persons, just like the pilot, assume a certain amount of risk that would not be expected in an air carrier or other commercial operation. The risk derives not only from the medical status of the pilot, but the pilot's proficiency and experience as well as the airworthiness of the aircraft.

By taking a more flexible approach to the certification of private pilots, we are able to gain valuable experience regarding certain medical conditions, their treatments, and their impact on aviation safety. Our favorable experience frequently allows us later to apply similar certification policies to commercial pilots with a data-derived indication of the insignificance of the risk.

One might suggest that our approach, allowing greater flexibility in the medical certification of private pilots, constitutes experimentation with safety in private operations. This suggestion might have some validity if private pilots who are granted special issuances experience a significant number of medically related accidents. However, data collected by researchers at the Civil Aeromedical Institute clearly indicate that they do not.

Given all the arguments and considering our favorable experience in granting special issuances, I think we'll stay our certification course.

Mr. Jordan, MD, JD, is the FAA's Federal Air Surgeon.

This article appeared in The Federal Air Surgeon's Medical Bulletin i Winter 1998. Previous editorials can be found on the FAA Civil Aeromedical Institute's (CAMI) Website at http://www.cami.jccbi.gov/AAM-400A/editorls.htm>.

DIAPERS, SEWING, AND NEEDLE POINT. IS THIS AVIATION?

by H. Dean Chamberlain

Terry Ross photo.

Editor's Note: The April 1999 FAA Aviation News contained an article titled "Condolences To Patrick and A Look At Some Lessons He Taught Us." The article was about the lessons learned from a fatal sport parachute jump made by Patrick de Gayardon. One was about the important role FAA certificated parachute riggers play in the parachute industry. The following article details some of a rigger's training requirements and privileges after certification.

David M. DeWolf: A legend in his own time? Maybe. For those not familiar with the name, DcWolf is considered by some I have met recently in the parachute industry to be one of the most knowledgeable master parachute riggers in the United States.

Upon first meeting the 66-year old, retired federal government pharmacist, one would not suspect he has made almost 10,000 parachute jumps. "I need about 300 jumps this year to make my 10,000th jump," he said during his annual rigger training course he conducts each year in Elizabethtown, PA. "I made over 400 jumps last year, so I hope to have no problems getting the 300 this year," he said. Who said skydiving was only for the young?

Like many of his students, DeWolf, went from being a skydiver to being one who not only jumps, but one who became a trained and FAA certified parachute rigger. Some do it because it allows them to be able to pack their own reserve parachute and those of friends. Others do it because it opens some business avenues. But for Dave, his passion for parachutes and being a rigger became his life's ambition.

Over the years, that passion has made him a recognized figure in the rigger community. One, who because of his professional and personal interest in all aspects of being a rigger, has become a role model for his students. "I learn as much from my students and instructors who help teach the course as I give to them," DeWolf said. As a result, he has become a one man center of rigger knowledge. Adding to his creditability is the fact he is also an FAA Designated Parachute Rigger Examiner (DPRE) allowed to test and recommend rigger applicants for their FAA riggers certification.

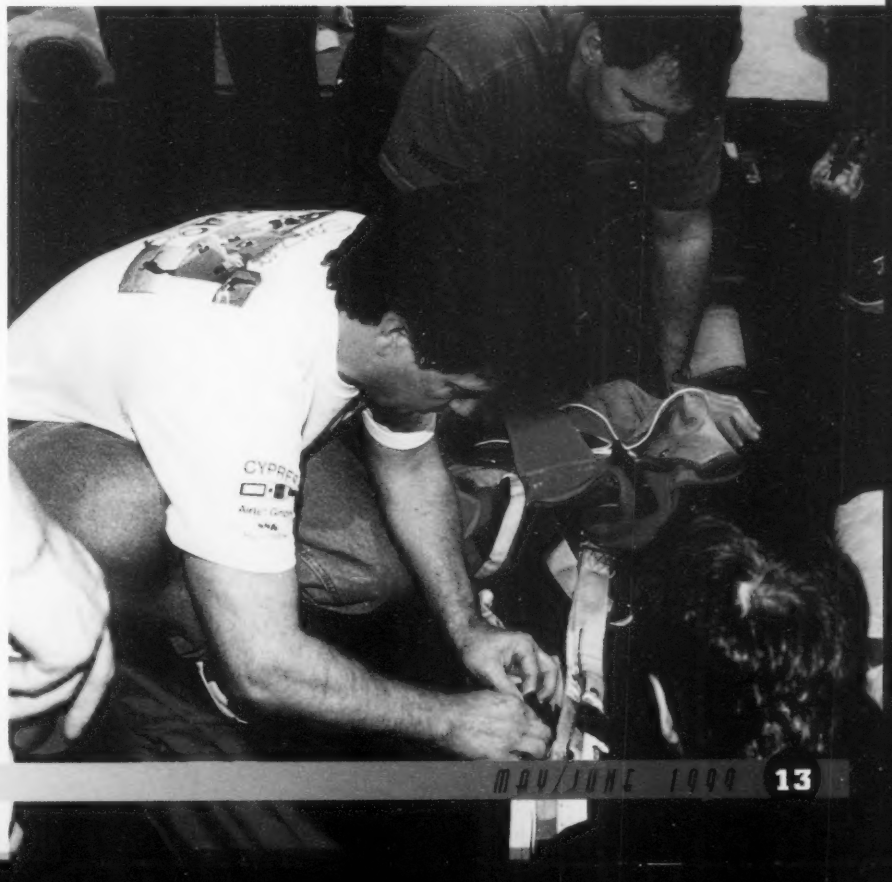
As stated, some skydivers want to be able to pack their own reserve parachutes. The reason is although trained skydivers can pack their own main parachute, all emergency parachutes (reserve) carried by skydivers and emergency parachutes worn and for use by pilots and others must be inspected periodically and repacked by FAA certificated parachute riggers. Dave's training course is one of only a

Photos on this page by H. Dean Chamberlain

few in the nation that trains a large group or class of students at one time.

Riggers acquire their knowledge and training though varied sources. The military trains many riggers. Once designated a military rigger, they can apply to the FAA for their civilian rigger certification. Some rigger applicants are trained by certificated riggers on an individual basis. A few without any parachute background or training may chose to attend one of the few schools in the nation that provide all of the required training for certification. These courses may take several weeks to complete the required training in preparation for the student to take his or her FAA required knowledge and practical tests. In the case of DeWolf's course, a maximum exposure type of course, the minimum attendance qualification is for the student to have made at least 100 skydives packing his or her own main parachute.

"My course is a very rapid pace



Terry Ross photo.

training course, and we don't have the time to teach someone with no parachute knowledge or experience the very basics of packing a parachute. We expect our students to know the basics before they arrive. We then will teach them what they need to know and be able to do to become certificated riggers," he said.

DeWolf's course starts before the students arrive for their first training session. As part of the enrollment and application process, each student is sent an information package they are expected to study and know by the time they arrive. Starting on a Friday night, they work their way through the weekend and the following week before taking their required FAA knowledge and practical tests on the following Friday through Sunday. During that period, they must learn such skills as sewing, yes, sewing, to be able to make minor parachute and harness repairs and modifications, how to inspect a parachute for airworthiness, and how to service and pack various

H. Dean Chamberlain photo.

types of parachutes from the old military-style round parachute to today's square-rig performance parachutes to the newest "kid on the block" in the parachute industry, the tandem rig.

Simply stated, a tandem rig is a parachute designed for two people. It provides a qualified tandem instructor skydiver using a specially designed large parachute system made for two people to introduce a "newbie" jumper to the sport of skydiving. With the required tandem training completed by the newbie and providing an added level of safety because an experienced instructor is attached to the newbie's harness, tandem skydiving has become for many first time jumpers the preferred method for making that first jump. The system is ideal for those who only want to make a jump or two to see if they really want to learn how to skydive on a regular basis. They don't have to spend the training time and money necessary to learn how to safely make a first-time solo jump.

While demonstrating how to pack a tandom rig, one of Dave's instructors told the students that a tandom rig is just like a regular rig; it is just bigger with a few extra items to check. He is right. The canopy is huge compared to an individual rig.

During the course, each student is required by FAA regulations to pack a minimum of 20 parachutes. Each repack is certified in the students packing logbook by one of the many instructors who support the training course and teach many of the training modules. During the course, there may be as many instructors who either come to teach a specific segment of the course or stay throughout the course to work with the students as there are students.

This year's course had 23 students. Their age ranged from those in their 20's to those who appeared to be well into their late middle years. The minimum age for FAA certification is 18. This year's class included students from across the United States including one student from Puerto Rico and one student from Spain. This demographic spread is typical of DeWolf's classes.

H. Dean Chamberlain photo.

RIGGER CERTIFICATION RULES

FAR Part 65 Subpart F details the regulations that applies to riggers. Starting with FAR §65.111, Certificate required, the Subpart explains their required training, areas of responsibilities and limitations, and their certification. Like pilot type ratings, parachute riggers may be type rated to pack each of the four main styles of parachutes. Those styles are seat, back, chest, and lap.

FAR §65.123, Additional type ratings: Requirements outline the training and testing requirements for riggers to add a parachute type rating to his or her certificate.

FAR §65.125, Certificates, Privileges, outlines the privileges, responsibilities, and limitations of the two types of rigger certificates the FAA issues. Those certificates are senior parachute rigger and master parachute rigger with the master rigger certificate being the advanced certificate. The master rigger minimum qualifications include at least three years experience as a senior rigger and have packed at least 100 parachutes of each of two types of parachutes in common use. The complete requirements for the master rigger certificate are outlined in FAR §65.119, Master parachute rigger certificate: Experience, knowledge, and skill requirements.

FOR MORE INFORMATION

For more information on DeWolf's course or parachutes in general, he can be contacted at his Paraloft, Inc. His telephone number is 717-367-0808. Not only is he willing to discuss his own course, he is willing to talk about other training courses and instructors that conduct rigger training. Since the rigger training community is so small, it seems everyone knows everyone involved in the business.

For more information about the parachute industry, you can contact the Parachute Industry Association (PIA) or the United States Parachute Association (USPA). PIA's telephone number is 972-231-4127. PIA's Internet website address is www.pia.com. USPA's telephone number is 703-836-3495. The USPA's Internet website address is

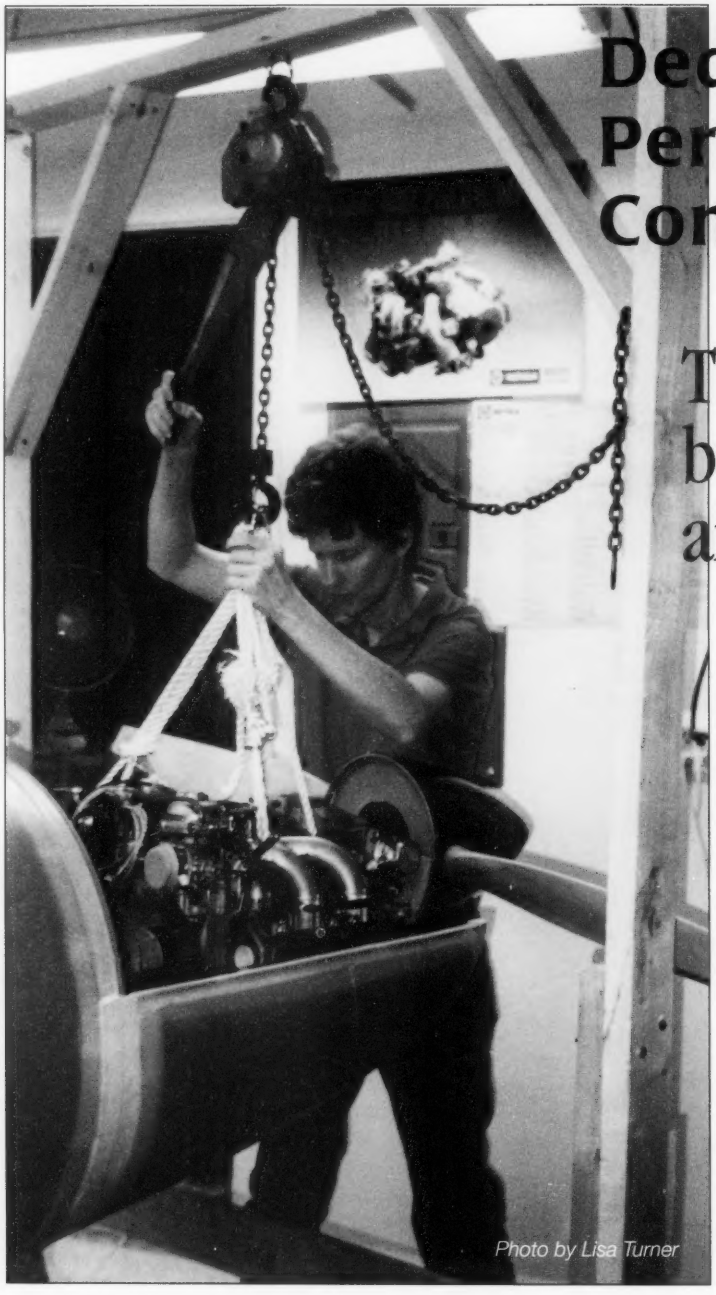


Photo by Lisa Turner

Dedication-Perseverance-Confidence

The satisfaction in building your own airplane

by Kristina Tatusko Henry

Home built

Aviators the world over can admire those small aircraft they see flying over towns and fields everywhere. It is those rare few who can fully appreciate aircraft like the Pulsar XP, a 160 mph two-person home-built, after spending 1,840 hours constructing one in a garage. Lisa Turner is one of those few. Lisa received her private pilot's certificate in 1996 after years of dreaming about becoming an aviator. When she set out to build her own airplane, she had no idea of the time and energy it would require. But once the task was completed, Lisa realized a dream that has taken her on several cross country flights since.

A 1974 graduate of Washington College in Chestertown, MD (on Maryland's Eastern Shore), Lisa moved to South Florida, having spent most of her life in Massachusetts and New York State. It was in Florida where Lisa began her technical vocations, beginning as a bicycle shop mechanic apprentice for a year. It didn't take long for Lisa to start her own retail bicycle sales and service business while also performing automotive repairs, in-

Photo by Steve Shannon

cluding brake jobs and tune-ups.

It was during this time that Lisa pursued another vocation, flying, which began in 1974 with a gift of lessons in a Piper Cherokee.

"At the time I had just graduated college and my wallet wouldn't accommodate continuing flight school."

In 1978, Lisa became one of the few women in the U.S. to become nationally certified by the Association for Service Excellence as an Automotive Tune-Up Specialist. Lisa started her own bike sales and service shop, with revenues reaching a quarter of a million dollars in its fifth year. Lisa sold the business at a profit and returned to school to pursue a career in electrical engineering.

"Other interests filled my life until 1995, when I moved into a house that was located on the downwind for Runway 27 at a nearby airport. My dream awakened. Asleep at night, I would stretch my arms out and take off through the neighborhood - turns, climbs, glides, dives . . . . wake up . . . it's time to learn to fly."

In December of 1995, Lisa took another bold step. Deciding to build her own plane, this determined pilot bought several aviation magazines.

"Throughout the pages I saw aircraft kits . . . . I began my research in earnest. I read everything I could get my hands on. I spent time at the airport talking to builders. I went to Sun 'N Fun for the first time."

Like many pilots who build their own aircraft, Lisa was determined to learn as much as she could.

"I realized I would know every inch of the airplane intimately; I would be able to do my own condition inspections and mechanical work."

Building a plane was a reality, selecting the type of plane became a difficult choice. Ordering six information kits narrowed the field down for Lisa.

"Finally my choice narrowed down, guided by my requirements for low wing, composite construction, two-place, an economical, modern engine (Rotax), capable of cross country comfort, good looks and tame enough for a low time pilot but full of spunk. And there it was: out from the pages of the magazine jumped the PULSAR."

"I traveled to the factory in San Antonio for a demo ride. Bob Kromer of Aero Designs met me at the airport and took me to the Pulsar hangared nearby. As we rode to the airport, Bob patiently answered my questions about the building process. The more I heard, the more enthusiastic I became. When we reached the hangar I was surprised to see that the airplane was even more attractive in the flesh. Let's fly! As we lifted off the small Bulverde runway, Bob gave me the stick. We climbed to 7,500 feet and put the airplane through its repertoire. I was amazed at the power, smooth response, and quietness of the cockpit. This was the perfect airplane for me! One hundred forty - 150 mph cruise at 3.5 mpg, 1,200+ fpm climb out speeds, 600+ miles in range, and a stall speed of 45 mph."

Thrilled by what she saw, Lisa went back to the factory and placed her order.

Convincing her that it would be a

doable project for her, Bob gave her construction manuals to take home.

What Lisa had enough of was tools from her days as a bicycle shop owner. Time was another matter. Already working a 50 to 60 hour week as the human resource manager at Sensormatic Electronics Corporation, Lisa had to put her time management skills to good use.

The irony of beginning her project on April Fool's Day was not lost on Lisa. Hitting the 1,000-hour build mark, caused her to wonder if she would ever see its completion. Deciding to add IFR capability rather than going with VFR was an easy decision for Lisa. It was those "bells and whistles" that presented her biggest challenges.

"The instrument panel... ended up taking much more time than I'd anticipated," said Turner.

"I used a program called 'Panel Planner' which was a big help. I had Aircraft Spruce and Specialty Company cut the panel out of .090 aluminum and powder coat it. I bought all the instruments from them and they were kind enough to weld the radio racks in and wire the sockets and switches. The wiring for the panel was complex and I spent a large amount of time making circuit diagrams."

Add an AM/FM cassette radio behind the seats with a wired remote control at the panel, strobe/nav system, fuel sump drains, electric pitch and roll trim, NASA type temperfoam seat cushions, a storage compartment in the armrest, super soundproofing foam throughout the cockpit and footwell, cabin heat, an engine cooling fan, a landing light, map pockets, stereo speakers in the baggage compartment, and a canopy lock and suddenly this little project took on a new meaning.

"I also designed a set of brake extensions for the Matco heel brake setup to convert them to toe brakes which is working well. It was a lot of fun thinking up things to add, and the other builders had some great ideas too," said Turner.

The entire 1,840 build hours or 20 months were enough to make even the most seasoned aircraft builder cringe from exhaustion. To avoid any surprises at the time of inspection, Lisa enlisted the help of an EAA Technical Advisor to inspect her work at various build stages. She also enlisted an EAA Flight Advisor to make her test flight as safe as possible.

"When I had my FAA airworthiness inspection, the designated examiner couldn't have been more professional and helpful, as well as complimenting me on my project quality," said Turner. "I think the system for homebuilts is excellent - not too much red tape, but

Photo by Steve Shannom

Photo by Lisa Turner

Photo by Gretchen A. Drilling

enough safeguards to ensure the highest level of safety for everyone."

When the moment came for the test flight, Lisa was, for the first time, in 20 months of building, unsure.

"With only 114 flying hours, I had considered enlisting an experienced Pulsar pilot to do my first flight. This is a very individual decision, after going to the Pulsar fly-in in Kansas and getting nearly 10 hours of flight time in Pulsars, I felt comfortable making this important step in my own plane," said Turner joyfully.

Turner recalls the day of her test flight. "I thrilled at the sensation of lifting into the air and feeling the powerful little Rotax engine pull the aircraft up at 1,000 fpm . . . . I turned downwind and found the plane going 120 mph! I pulled the power back to 2,000 rpm and pulled the nose up. The exceptionally responsive controls were smooth and predictable, but I had never flown anything this slick."

A day to be remembered for a long time, and Lisa has been an avid flyer ever since. With over 135 hours in her Pulsar, Lisa has since enjoyed short trips to the Keys and other exotic Florida locations, including Marco Island, Sebring, Tampa, Everglades City, Islamorada. Last fall, Lisa made her first true cross country in the Pulsar, a 3,800 mile trip from Florida that eventually ended up in Bar Harbor, Maine—and return.

"At one point I was registering a ground speed of 197 mph with an airspeed of 156 mph with a great tailwind at 9,500 feet," said Turner recalling that trip.

What's next for this female aviator?

"I am seriously considering a RotorWay helicopter," says Turner. "I would also like to build a Lancair someday. We'll see which one wins out for now!"

If anyone is interested in a Pulsar XP, Lisa's willing to talk or have would-be buyers and home-built fanciers browse via her Web page at http:\\pages.prodigy.net\lisaturner.

For this pilot, there aren't enough hours in the day to do everything she's set her mind to do. But for now, the prospect of building and flying another, larger airplane is enough to keep any pilot, mechanic, and manager happily engaged for a long time.

Any tips she can give to first time builders?

Turner says, "dedication - perseverance - confidence - and a passion for flying can enable anyone to get into the air in their own creation!"

Ms. Tatusko Henry is the Assistant Director of Alumni Affairs at Washington College in Chestertown, Maryland and author of "Sam: The Tale of a Chesapeake Bay Rockfish."

Rules and Regulations of Airplane Building

BY RON ALEXANDER

REPRINT FROM MAY 1997 SPORT AVIATION

We hear the word "experimental" used within the sport aviation industry on a regular basis. The most common use of experimental applies to a classification of an airworthiness certificate used for an amateur built airplane. This is different from the airworthiness category assigned to an airplane that is mass produced by a manufacturer which is then sold to the general public. I will explore the exact meaning of the word experimental later in this article. Suffice to say that FAR (Federal Aviation Regulations) pertaining to the operation of experimental airplanes can be confusing. I will attempt to clarify the confusion that exists and to simplify the regulations as they apply to building an airplane. Each phase of building and operating an amateur-built airplane will be discussed along with the applicable regulations.

In general, we are very privileged to have only a minimum number of regulations that actually pertain to building and flying our amateur-built aircraft. When an aircraft manufacturer plans to mass produce an airplane, they are required by FAR to comply with design standards that are detailed in FAR Part 23. This regulation is very restrictive as to design, weight, speed, etc. Amateur builders are not restricted by Part 23 or any other certification regulation. Basically, our only restriction is that we must construct and assemble the majority of the aircraft. (Most aircraft kit for recreation and education manufacturers actually voluntarily comply with the guidelines of Part 23.) Part 23 is titled "Airworthiness Standards: Normal, utility, acrobatic and commuter category airplanes." As the builder of our own airplane, which will not be mass produced, we are limited only by our imagination and ingenuity. Of course, when we build our own airplane we are going to impose strict limitations and restrictions concerning quality of construction, materials used, etc. We certainly want a safe, reliable airplane to fly and in which to carry our passengers.

Let's define the "experimental" category and see how it applies to our amateur-built airplane. To legally fly within the United States, we must have four documents on board: an airworthiness certificate, a registration certificate, a copy of the operating limitations, and the weight and balance for our airplane. Airworthiness certificates are classified under two categories according to FAR §21.175 - standard and special. Standard airworthiness certificates are issued for most production airplanes and they are usually classed under the normal category. We are interested in special airworthiness certificates that are further broken down into several additional categories of which one is "experimental." Experimental airworthiness certificates are issued for different purposes. These purposes are: (1) research and development, (2) to conduct flight tests to show compliance with airworthiness regulations, (3) for crew training, (4) for exhibition, (5) for air racing, (6) to conduct market surveys and sales demonstrations, (7) to operate an amateur-built airplane, and (8) to operate a kit-built aircraft that was assembled by a person from a kit manufactured by the holder of a production certificate for that kit.

We will primarily concern ourselves with purpose number 7, to operate an amateur-built airplane. Fully 95% of all airplanes that we build from a set of plans or from a kit will be certificated under the amateur-built classification. Purpose number 8, the kit plane classification, only applies to kit manufacturers who have certified their airplane under a type certificate termed a "primary category" aircraft. To date, only one kit plane manufacturer falls in this category to my knowledge. All other kit plane manufacturers sell their kits to be classed under the experimental certificate for the purpose of operating an amateur-built aircraft. FAR §21.191(g) is the heart of all regulations for the builder of an airplane. This regulation states the following: "Operating amateur-built aircraft. Operating an aircraft the major portion of which has been fabricated and assembled by persons who undertook the project solely for their own education or recreation." This regulation is the essence of custom aircraft building. The intent of the classification is very clear. Notice that one or more persons may build the airplane but they must build it only for their own enjoyment or education, and not for profit.

Ultralight airplanes fall under a different set of rules. If your completed airplane meets the requirements of FAR §103.1, it is classed as an ultralight vehicle and as such does not require an airworthiness certificate. Briefly, these requirements are: single pilot, used for recreation only, weighing less than 254 pounds empty weight, fuel capacity not to exceed 5 U.S. gallons, not capable of more than 55 knots in level flight, and a power-off stall speed not exceeding 24 knots. As you can readily observe, the majority of custom built airplanes exceeds one or more of these criteria. Often, the owner of an ultralight airplane will choose to certificate their aircraft under the experimental category. This is usually done to comply with the regulations regarding weight, passengers, etc. Note that the operator of an ultralight does not have to be a certificated pilot contrasted to the operator of an amateur-built airplane who, of course, must be a licensed pilot and the holder of a current medical certificate.

To continue our discussion of FAR

§21.191(g), it is clear that to certificate an airplane under the experimental category for amateur-built operation, we must assemble and construct at least 51% of the airplane. The FAA emphasizes this restriction in at least two publications. The first is FAA Order 8130.2C, which is the airworthiness certification manual used by FAA Inspectors as a guide to inspect an airplane and to issue an airworthiness certificate. On page 116 of that guide, the following guidelines appear under the eligibility section. (1) "Amateur-built aircraft may be eligible for an experimental airworthiness certificate when the applicant presents satisfactory evidence that the aircraft was fabricated and assembled by an individual or group of individuals." This section goes on to state that the project must be undertaken for educational or recreational purposes and the FAA must find that the airplane complies with acceptable standards. Aircraft that are manufactured and assembled as a business for sale are not considered to be amateur-built. This statement appears within the Order: "NOTE: Amateur-built kit owner(s) will jeopardize eligibility for certification under FAR § 21.191(g) if someone else builds the airplane." The applicant for amateur-built certification must sign a notarized form (FAA Form 8130-12), certifying the major portion, or 51% of the aircraft, was fabricated and assembled for educational or recreational purposes, and that evidence is available to support the statement. The second place the 51% rule is emphasized is in Advisory Circular 20-27D, Certification and Operation of Amateur-Built Aircraft. This section simply emphasizes the major portion rule.

When you purchase an airplane kit from a manufacturer, the kit should be listed on the FAA listing of kits that have been evaluated to ensure that 51% of the building will be completed by the purchaser (this is commonly known as the major portion rule). I want to emphasize that the FAA in no way endorses any of these kits or do they approve kit manufacturers. They simply evaluate the kits solely for the purpose of determining if an aircraft built from the kit will meet the major portion criteria. A listing of these kits is available from your local FAA office. I do not recommend purchasing a kit that is not on this listing unless you are prepared to prove to the FAA Inspector that the kit meets the proper criteria.

The FAA does not expect the builder to personally fabricate every part of the airplane. A number of items can be purchased and several tasks can be contracted commercially. FAA Advisory Circular 20-139, "Commercial Assistance During Construction of Amateur-Built Aircraft," provides a very detailed guide concerning what can be purchased complete and what can be contracted commercially. Engines, propellers, wheel and brake assemblies, and standard aircraft hardware are examples of items that may be purchased. Installation of avionics, painting an airplane, upholstery items are examples of tasks that may be contracted. The bottom line of the entire discussion is that you must prove to the FAA Inspector who issues your airworthiness certificate that you have complied with FAR §21.191(g). In the next issue we will discuss the necessary documentation to present to the inspector to assure your compliance.

If you decide to allow someone else to build your airplane to be certificated as amateur-built, you will be required to certificate it under the experimental category for the purpose of exhibition. This category is much more restrictive than amateur-built. The purpose of this category is to allow the holder to exhibit their airplane at air shows, motion pictures, television filming, etc., and, of course, to fly to and from these productions. I will not spend time discussing this category since it is rarely used.

Now that I have discussed the general regulations concerning building your airplane, I will detail specific regulations as they apply to each phase of building, flying, and maintaining an amateur-built airplane. I would recommend that you obtain a copy of the regulations for your own reference. Several books are available that contain the FAR along with computer discs containing all of the FAA regulations. The FAA also maintains a web site with all regulations. This site can be found at <www.faa.gov>.

INITIAL BUILDING PHASE

The first phase of construction is, of course, the building phase. I would highly recommend that before you begin your project you ask your local FAA office for their information packet that is available relating to amateur-built airplanes. The part of this packet that you will refer to regularly is Advisory Circular 20-27D. Regarding regulations governing the first phase, we have discussed in detail FAR §21.191(g). Another regulation, FAR §21.173, presents the eligibility for an airworthiness certificate. FAR §21.191 defines all purposes that are allowed for licensing under the experimental category including, of course, amateur-built. FAR §21.175 defines the classifications of airworthiness certificates. FAR §21.193 contains the information that must be submitted for an experimental certificate. Advisory Circular 20-27D presents this information much more completely. FAA Part 45 details the markings that are necessary for your aircraft with respect to what is required, size, location, etc. FAR § 45.23 is where we are told that we will display the word "experimental" in letters not less than two inches high nor more than six inches high near the entrance to the cabin or cockpit. FAR §45.29 provides us with the size of registration marks and specifically allows us, as owners of experimental aircraft, to use three inch high numbers and letters providing our maximum cruising speed is less than 180 knots. If our cruising speed is higher than 180 knots, then we are required to use 12 inch letters and numbers. An additional regulation applies if our airplane had an experimental certificate issued more than 30 years ago. This regulation allows us to use numbers and letters only two inches high. FAR §45.22 specifies the rules as they apply to the older airplanes. Details of spacing, width, and other factors are discussed in this section.

Continuing the building stage, FAR §47.15 informs us about registration numbers. You may select an "N" number of your choice providing the number is currently not in use on another airplane. FAR §47.33 lists the information that must be submitted with your application for the "N" number. If you intend to fly your airplane at night or under Instrument Flight Rules, you are required to have specific equipment. The necessary equipment, including instruments, radios, etc. is outlined in FAR §91.205. This regulation also tells you what is needed for VFR flight during the day. FAR §91.207 outlines the requirements for emergency locator transmitters (ELT). The requirements for an ELT are basically the same for all airplanes, including amateur-built. It should be noted that if you remain within 50 nautical miles of your home airport and you are engaged in flight training, you are not required to have an ELT. Also, if you have a single place airplane, you are not required to install an ELT.

Obviously, there are a number of other issues involved in the building phase namely the FAA inspection process and the required documentation and papers. After the FAA inspects your airplane, the inspector will issue a set of Operating Limitations. Those limitations then become regulations for operation of your aircraft and they are actually part of the special airworthiness certificate. The airworthiness certificate will be issued at the time of the inspection and will contain two phases. Phase I is the initial flight testing phase of the aircraft, and Phase 2 lists the operating limitations that go into effect upon completion of the flight testing. Phase 2 applies for the duration of the certificate.

FLIGHT TESTING

FAR §91.305 defines a flight test area. Basically, it states that you must conduct your flight testing over sparsely populated areas having light air traffic. FAR §91.319 provides a listing of operating limitations. As I mentioned, when your aircraft is inspected you will be given a copy of operating limitations. Usually, the inspector will issue Phase 1 and Phase 2 at the time of inspection providing you with two sets of operating limitations: flight testing and subsequent operation. The flight test area is defined within the Phase 1 limitations along with the required number of hours you must fly the aircraft. The primary restrictions regarding flight testing are: (1) no passengers including flight instructors or persons non necessary for the conduct of flight, (2) day, VFR only, (3) no operation over congested areas, (4) you must advise ATC that you are experimental, and (5) the pilot must have the appropriate ratings. Of course, the general operating rules under FAR Part 91 are applicable. Phase 1 operating limitations have an expiration time of 12 months from date of issue. All flight testing must be completed within that time period or the aircraft must be reinspected. One of the restrictions in FAR §91.319 that is interesting is that in order to have the Phase restrictions lifted you must prove that the aircraft has no hazardous operating characteristics and that it is controllable throughout its normal range of speeds and maneuvers. The FAA has an Advisory Circular that is very helpful in providing guidelines for flight testing. This circular, Advisory Circular 90-89A, Amateur-Built Aircraft Flight Testing Handbook, is necessary to read prior to your first flight. Also, the EAA Flight Advisor Program is highly recommended. The flight testing phase should be an enjoyable conclusion to your building experience and it will be if planned and executed properly.

NORMAL OPERATION OF YOUR AMATEUR-BUILT

Once again, all of the general operating rules under FAR Part 91 apply to daily operations of your aircraft. In addition, the operating limitations presented under FAR § 91.319 and as issued by the FAA Inspector at the time of inspection govern. After completion of Phase 1, you are then allowed to carry passengers and fly at night or IFR if so equipped. Phase 2 limitations do add some restrictions that merit discussion. First of all, you may not carry passengers or property for hire. Secondly, any major changes that are made to the airplane as defined by FAR § 21.93 require inspection by the FAA prior to further flight. A minor change is defined as one that has no appreciable effect on the weight, balance, structure, or anything affecting the airworthiness. Examples of a major change would be a different horsepower engine, a different pitch propeller, a change in basic design, etc. If a major change is made, notify the FAA in writing providing the details of the change to ascertain whether or not an inspection will be required. Thirdly, you may not operate your airplane unless it has received a condition inspection (annual inspection). This will be discussed in the next section.

MAINTAINING YOUR AIRPLANE

As I mentioned in the previous section, a condition inspection is required every 12 calendar months on amateur-built aircraft. This check is similar to an annual inspection required by FAR Part 43 on production airplanes. The Phase 2 Operating Limitations specifically refer to FAR Part 43, Appendix D, as the guide to performing this inspection. The inspection can be performed by any licensed A&P mechanic, an FAA Approved Repair Station, or by the builder of the airplane provided the builder obtains a "Repairman's Certificate" from the FAA. FAA Advisory Circular 65-23A, Certification of Repairmen (Experimental Aircraft Builders), is available for information concerning application and privileges of this certificate. In short, the primary builder of the airplane is eligible to apply for this certificate which then permits inspection of the airplane and a logbook endorsement of the condition check. It is noteworthy that the primary builder must be one person. If a group of people builds an airplane, only one can be designated as the primary builder. In addition, the issuance of the repairman's certificate only applies to the one airplane that has been built by the pri-

mary builder and no other airplane regardless of same type, etc.

Normal maintenance on an experimental airplane can be performed virtually by anyone regardless of credentials. Once again, this does not apply to the condition check previously discussed. You can perform maintenance items on the engine whether or not it is "certified." Once a certified engine is placed on an amateur-built aircraft and is operated, it no longer conforms to its type design. This means that the engine can no longer be placed on any aircraft other than an amateur-built until it has been inspected and found to meet its type design. It also must be found to be in a condition for safe operation "airworthy." Once again, common sense should rule. We do not want to overhaul an engine on our airplane unless we are equipped to do so with tools and proper knowledge and data.

I will point out that FAR Part 43 specifically states that the rules of that part do not apply to amateur-built airplanes. With that in mind, anyone can maintain the airplane. However, remember in our earlier discussion that Part 43, Appendix D was referenced in Phase 2 operating limitations presented to the builder at the time of inspection. It is referenced as a guide to be used in conducting condition inspections. That means Part 43, Appendix D does apply to the condition inspection because of this reference. The FAA has further clarified AD (Airworthiness Directives) as they apply to amateur-built airplanes. Airworthiness Directives cannot apply to any part on an amateur-built airplane unless that specific airplane is cited along with who should do the work and to what standards. The reason for this is because once an approved part is placed on an experimental airplane it is no longer considered an approved part. Again, let me emphasis that just because a regulation does not require an action it still may be prudent and within our best interest to conform to an AD note. We are striving to improve the safety record of this industry and in all cases we must act on the side of common sense and good practice.

REGULATIONS INVOLVING THE SALE OF YOUR AMATEUR-BUILT

There are few regulations governing a sale of your airplane. The airworthiness certificate is transferable with the airplane even though it is experimental (FAR §21.179). The proper bill of sale and registration documents must be completed when you sell the airplane. Of particular

ADDITIONAL INFORMATION: Experimental Exhibition

An aircraft may be issued an airworthiness certificate under the provisions of 14 CFR part 21.191(g) if the major portion of the aircraft was fabricated and assembled by one or more persons, solely for the purpose of education and recreation. An aircraft may not meet the requirements for certification under the amateur-built rule if the aircraft has been built by a commercial builder. If the aircraft cannot meet the requirements of 14 CFR Section 21.191(g) as an aircraft which was built for the purpose of recreation and education, the owner may have no recourse other than certification in the experimental-exhibition category.

An applicant for an experimental category airworthiness certificate for the purpose of exhibition must keep in mind that the purpose is to exhibit the aircraft in motion picture and television productions or at airshows or other organized events and not, as some think, for personal transportation. Proficiency flying (for the purpose of practicing for airshows) is also one of the purposes for the certification.

Operators or owners of experimental category exhibition aircraft will have their aircraft assigned to one of four groups under which operating parameters are established.

Group 1 aircraft are those specialty aircraft that posses design characteristics that make the aircraft suitable for competition, would only be used in performance based competitive events (air racing, aerobatic, soaring), and would not be utilized for personal business or transport activity. These aircraft are limited to a proficiency area of 300 nautical miles from their designated home base airport.

Group 2 aircraft includes turbo-fan, turbo-jet, or turbo-prop aircraft except those which have a design capability or carrying cargo or more than four occupants. These aircraft are limited to a proficiency area of no more than 600 nautical miles from the designated home base airport with a non-stop flight that begins and ends at the home airport. An alternate airport may be selected within the proficiency area, however, the operator must notify his or her Flight Standards District Office of the destination before making such a flight.

Group 3 aircraft are those piston-powered, military aircraft, replicas and vintage aircraft produced before 1945 and commonly classed as "Warbirds." These aircraft are limited to a proficiency area of 300 or 600 nautical miles depending upon horsepower and never-exceed speed (Vne)

Group 4 is the "other" category where most commercially built aircraft are placed. Group 4 is for aircraft which do not clearly fit into groups 1, 2, or 3. The aircraft are limited to non-stop flights from the home airport or to predetermined airshows and other exhibits.

The appropriate reference for experimental category aircraft issued an airworthiness certificate for the purpose of exhibition, is FAA Order 8130.27. Information regarding this and other FAA Orders and Notices may be found at <www.faa.gov>.

interest is the fact that the new owner may maintain the newly purchased airplane, but may not perform the condition check. The repairman's certificate is not transferred with the airplane. It remains with the original primary builder. That person legally may still perform the condition check if you can persuade him to do so. If you are purchasing a partially completed kit you need to obtain the proper documentation to ensure you will meet the major portion rule. FAA Advisory Circular 20-27D has the following warning: "CAUTION: Purchasers of partially completed kits should obtain all fabrication and assembly records from the previous owner(s). This may enable the builder who completes the aircraft to be eligible for amateur-built certification." Once again, a call to your FAA Inspector will prevent future problems. The time spent by the original builder is usually applied toward the total time required to build the airplane. Documentation is necessary.

Summary of Federal Aviation Regulations Amateur-Built Aircraft

Initial Building

21.191 Basic definition of amateur-built
21.175 Classification of airworthiness
21.193 Needed information for experimental licensing
45.22 "N" number rules
45.23 Experimental display
45.25 Location of "N" number
45.29 Size of "N" number
47.15 General information/"N" number
47.33 General information/"N" number
91.205 Instrument and equipment requirements
Advisory Circular 20-27D
Advisory Circular 20-139

Flight Testing

91.305 Flight testing area
91.319 Operating limitations
Advisory Circular 90-89A

Normal Operation

21.181 Duration of airworthiness
91.25 Accident Reporting
91.207 ELT requirements
91.319 Operating limitations

Maintenance

21.93 Major and minor alterations
Part 43, Appendix D
Advisory Circular 65-23A

Sale

21.179 Transfer of airworthiness

CALENDAR OF EVENTS

Asia-Pacific Aviation Symposium

The U.S. Trade and Development Agency (TDA) and the Federal Aviation Administration with other organizations are sponsoring the Asia-Pacific Aviation Symposium: Managing the 21st Century Aviation System in Los Angeles June 7-10.

For more information, interested readers can contact the Foreign Trade Association of Southern California, 900 Wilshire Blvd., Suite 1434, Los Angeles, CA 90017. Its telephone number is 213-627-0634. Its FAX number is 213-627-0398. Its email address is <foreigntrade@earthlink.net>. U.S. companies only may attend.

1999 Civil Air Patrol Conference

The 1999 Civil Air Patrol (CAP) National Board and Annual Conference August 12-14. The Conference will be held at the Adams Mark Hotel in Denver, Colorado. For more information on the conference, contact CAP National Headquarters at 105 South Hansell St. Maxwell AFB, AL 36112-6332; (334) 953-7593; FAX (334) 953-4245. The CAP National Website, <http://www.cap.af.mil>, has additional information on both CAP and the conference.

• Paper Annual?

I received my copy of *FAA Aviation News* today and have a couple of comments: In your "Safety Alerts" section you noted the defective engine exhaust system muffler as the cause of two fatalities. I bought my *Arrow* from a local FBO after having an independent pre-buy inspection completed, assurance from the FBO and the broker that all noted items on the pre-buy would be fixed, and a "fresh annual" done. All of this was noted in the purchase agreement. This should have resulted in someone noticing and addressing the same problem noted in the article. It was only while cleaning the underside of the cowl that I noticed a defroster hose hanging loose - its attachment had long ago separated from the heat muff. I found out only after the purchase of my plane that the selling FBO had not complied with a landing gear AD properly and that a list of other items for repair noted in the purchase agreement were never done or were addressed incompletely or incorrectly. This experience has given new meaning to the phrases "pre-flight check" and "paper annual" for me.

I now ALWAYS personally check and recheck everything I possibly can, and have learned to never trust the seller's mechanic's log book entries - he's only going to do what the boss tells him to do, and nothing more. It has cost me thousands of dollars to learn this lesson. This experience certainly undermined my trust in FBO's and the certification and licensing of mechanics upon whom I thought that I could bet my life, and the ability of the FAA to keep tabs on all of the disreputable characters out there in the airplane repair business.

Tom De Young
Grand Rapids, MI
Via Internet

It is regrettable you had such an experience. We want to offer two comments. First, please don't let this experience make you distrust the thousands and thousands of dedicated and conscientious maintenance technicians who work on our aircraft and in the industry everyday. We do trust them with our lives every time we take off in an aircraft.

The second comment is for you or anyone who thinks that a certificated airman has not fulfilled his or her responsibilities as outlined in the FAR to contact your local Flight Standards District Office (FSDO) and discuss the issue with the appropriate FAA aviation safety inspector. The three types of inspectors are operations, avionics, and airworthiness. We will investigate every such complaint.

The FAA needs the help of those involved in aviation to help it maintain the quality of service provided by those the FAA certificates to work in the industry.

• NEW WORD???

All the "Key Words" on page 10 of the January-February 1999 issue are familiar, but I have never heard the term "point out" used as described in the example in "Incident'ly A Turn of the Phrase, So to Speak" on page nine. Please let us all know what it means.

Gordon Lindblom
Via email

The article was taken from the Air Traffic Bulletin. *The article contains information for controllers dealing with both pilots and aircraft and other FAA air traffic controllers (ATC). The term is an internal ATC phrase used between controllers. The common interpretation listed in the Bulletin for the term "point out" is "An aircraft to monitor only; you won't talk to it." As a pilot, you should never hear the term.*

Regarding the same issue, Mr. William J. Kane of Alameda, California sent a similar comment. His letter said,

"The article in the Jan/Feb issue concerning proper verbal communication made some excellent points but also contained some ambiguities. For example the use of the words 'Point out.' In my 55 years as an instrument rated pilot, the word 'point' always referred to the decimal in a frequency and was never followed by 'out' which means 'end of message.' Exactly what it is supposed to mean in the article is unclear.

"The article was originally intended for controllers but was not edited properly for pilots. The first paragraph states, 'If a controller said to you...,' obviously referring to a pilot. In the fourth paragraph it states, 'you get the right pilot's attention,' this time refer-

FAA AVIATION NEWS welcomes comments. We may edit letters for style and/or length. If we have more than one letter on the same topic, we will select one representative letter to publish. Because of our publishing schedules, responses may not appear for several issues. We do not print anonymous letters, but we do withhold names or send personal replies upon request. Readers are reminded that questions dealing with immediate FAA operational issues should be referred to their local Flight Standards District Office or Air Traffic facility. Send letters to FORUM Editor, FAA AVIATION NEWS, AFS-805, 800 Independence Ave., SW, Washington, DC 20591, or FAX them to (202) 267-9463; e-mail address: Dean.Chamberlain@faa.dot.gov

ring to the controller. Later it says, 'If you stated, turn right heading two zero zero, the pilot knows exactly what you want....' Only controllers issue heading changes. The article should have been rewritten to relate exclusively to pilots who are the group for whom your magazine is intended."

FAA Aviation News *would like to remind everyone the magazine is intended for all airmen--and controllers read it, too. The need for pilots and controllers to understand each other is why the Aeronautical Information Manual (AIM) has a Pilot/Controller Glossary in it to standardize communication among pilots, controllers, and others in aviation. The need for effective communications within FAA is one reason why* FAA Aviation News *is distributed to all FAA facilities.*

• Parachute Article

Your article on parachutes was extremely well written and interesting. It did raise a question in this office about our interpretation of §91.307(c). This FSDO may have a misconception that needs some clarification.

Page 5, of your article has a paragraph that says, "So the regulations are clear, if you are doing any maneuver that exceeds the limitations listed above or is not necessary for normal flight and the flight is not a certification training flight then everyone on board must wear an approved parachute." We don't necessarily think the regulations are clear on this.

We thought FAR §91.307(c) specifically exempted "crewmembers" from having to wear parachutes if the bank or pitch exceed the specified amount (60 degrees and 30 degrees). We thought that to be true because FAR §91.307(c) says in parenthesis (other than a crewmember).

Further, the words "not necessary for normal flight" are not found in FAR §91.307(c). They are found in a FAR §91.303, which describes what is considered an aerobatic maneuver. This may not have anything to do with when parachutes are required per FAR §91.307.

So, we may be confused out here but we would like to know what we can "take to the bank" for an interpretation on these two items. I personally discuss these areas in flight instructor workshops put on by the Riverside FSDO, and I want to make sure I have not been putting out misinformation.

I offer these two scenarios to further clarify our confusion:

(1) A solo pilot does a loop without wearing a parachute. Is this a violation of FAR §91.307(c)?

(2) A pilot carrying a passenger does a maneuver obviously not necessary for normal flight but does not bank more than 60 degrees, and he does not pitch up or down more than 30 degrees. Is this a violation of FAR §91.307(c)?

R.C. Morton,
Safety Program Manager,
RAL FSDO

We agree what the regulations concerning the wearing of parachutes may be confusing. The following information was produced by the Flight Standards Service's General Aviation and Commercial Division's Operations Branch.

First, FAR §91.303, in pertinent part, defines aerobatic flight for the purposes of this section as intentional maneuver involving an abrupt change in aircraft's attitude, an abnormal attitude, or abnormal acceleration, not necessary for normal flight.

Second, FAR §91.307(c) states, in pertinent part, that unless each occupant of an aircraft is wearing an approved parachute, no pilot of a civil aircraft carrying any person (other than a crewmember) may execute any intentional maneuver that exceed (1) A bank of 60 degrees relative to the horizon; or (2) A nose-up or nose-down attitude of 30 degrees relative to the horizon.

Therefore, to respond to the specific scenarios presented by Mr. Morton:

A solo pilot does a loop without wearing a parachute. Is this a violation of FAR §91.307(C)? Answer: This is not a violation because the pilot is solo.

A pilot carrying a passenger does a maneuver not necessary for normal flight but does not bank more than 60 degrees and he does not pitch up or down more than 30 degrees. Is this a violation of FAR §91.307(c)? Answer: This is not a violation of FAR §91.307(c) because a parachute is not required. Within a strict definition of FAR §91.303 such a maneuver may be considered aerobatic flight, but a parachute is not required.

• Take-off 180 Degree Return for Landing

When I read the May-June 1998 Flight Forum and the story about the fatal 180 degree turn in the article titled Engine Failure on Takeoff, the article caught my attention. Years ago, when I was learning to fly the subject came up in a hangar flying session, and we beat it to death and could not reach a consensus. We took the question to Andy Traverso who was the senior instructor on the airport (Buchanan Field, Concord, CA). Andy was about 75 years old and had given about 32,000 hours of dual instruction to students (honest).

Andy said, "It's simple. If the engine quits shortly after takeoff in a single engine airplane, look 30 degrees left and 30 degrees right-you're not going to turn any more than that. Then, hit the softest and the cheapest thing in the area as slowly as possible."

Sometimes the simplest explanations are not only the easiest to remember, they're also the best.

Scott Gardiner
FAA Aviation Safety Inspector
Seattle Flight Standards District Office

Sometimes, you can't say it better. Thanks for the advice, Scott.

Women in Aviation Conference Continues to Grow

"A Decade of Dreams" was the theme of the 10th Annual International Women in Aviation Conference, held in March in Orlando, FL. In addition to another record-setting attendance (more than 2,500), the three-day conference had a number of other new "highs" as well.

The attendance reflected an 18% increase over 1998. The 43 concurrent sessions offered were the highest ever. One hundred three exhibiting companies occupied 145 booths in the exhibit hall, another record high. Scholarships awarded increased by one-third to nearly $400,000.

The number of sponsors for the conference also increased by one-third, and the sponsors now include major aircraft component manufacturers, airlines, aviation associations, aviation trade publications, and government agencies. Perhaps the biggest high of all was that the scholarship fund increased to the point where it can be sustained as a permanent endowment.

Among the scholarships awarded this year were B-777 and A-230 type ratings, several $10,000 scholarships to be used toward a rating of the recipient's choice, and a full, four-year scholarship to a high school student for a college or university with an aviation program. Even the scholarship "losers" came out winners: Several runners-up in the scholarship competition received interviews instead with major airlines, and four received the news at the conference that they had been hired by a major airline.

Women in Aviation, International is a non-profit organization dedicated to the encouragement and advancement of women in all aviation career fields and interests. Memphis, TN is the site of next year's conference, March 9 - 11, 2000.

The conference has finally outgrown hotels and will be held for the first time in a convention center to allow for the growing interest. In Memphis the 11th annual WIAC will be held in the Memphis Cook Convention Center. For more information, call (937) 839-4647 or e-mail wai@infinet.com . The organization's home page is located at <www.wiai.org>.

Commercial Forecast Reports Seventh Consecutive Year of Aviation Growth

U.S. Transportation Secretary Rodney E. Slater has announced that the nation's air carriers, braced by one of the strongest economies on record, have experienced seven straight years of traffic growth, with a record 643.3 million people traveling on U.S. commercial airlines in 1998. According to released figures, this trend will continue, with the number of air travelers increasing to almost one billion in 2010.

"Safety is President Clinton's highest transportation priority, and this administration is determined to provide the programs and policies to further enhance both the safety and efficiency of our air transportation system," said Slater. "The economic figures we are releasing are a positive report card on our effort to ensure that Americans have access to safe, affordable and efficient air travel."

FAA Administrator Jane F. Garvey said, "The outstanding growth in aviation is even more encouraging when you consider that there were no major air carrier accidents last year. As air travel continues to grow, the FAA is determined to ensure that Americans can continue to rely on the safest, most secure and efficient airspace in the world."

The announcement came as the FAA released its report, FAA Aerospace Forecasts Fiscal Years 1999-2010. The report shows that domestic enplanements increased by 2.1 percent in 1998, while international enplanements in the Atlantic and Latin American regions had significant gains. Traffic in the Atlantic region increased 9.2 percent, while traffic on Latin American routes grew by 5 percent. In addition, U.S. commercial air carriers reported an operating profit of $9.2 billion, a $1.3 billion improvement over 1997. Despite relatively slow increases in Asia, overall U.S. air carrier international enplanements are forecast to increase to 56 million in 1999 and grow 5.7 percent a year, reaching 103.1 million in 2010.

The FAA forecast provides extensive historical data and forecasts for the period 1999 through 2010 for large U.S. commercial air carriers, the nation's regional/commuter airlines, general aviation, and the military. For the first time, the report includes forecasts for commercial space transportation, Canadian transborder traffic, and cargo airlines.

The number of domestic passengers traveling on commercial air carriers is expected to increase to 567.9 million in 1999, a 2.4 percent increase over 1998. For the period 1998 through 2010, passengers are forecast to increase 3.4 percent a year, reaching 828 million in 2010. To accommodate this expansion, the FAA forecasts that the large commercial aircraft fleet will increase from 5,030 in 1998 to 7,165 aircraft in 2010, an annual increase of 3 percent.

Paralleling the increase in domestic air traffic, the number of passengers on U.S. and foreign flag carriers traveling to or from the United States are expected to increase to 132.2 million in 1999, a 4.8 percent increase over 1998. This growth is expected to continue at a 5.1 percent rate each year and reach 230.2 million in 2010. U.S. air carrier international enplanements are forecast to increase to 56 million in

1999 and grow by 5.7 a year, reaching 103.1 million in 2010.

Outpacing the large air carriers, commuter airline enplanements are forecast to increase to 71 million in 1999, a 7.4 percent increase over 1998.

Enplanements are expected to increase by 5.4 percent each year, reaching 123.8 million in 2010. In addition, the commuter passenger fleet is expected to increase from 2,039 aircraft last year to 2,886 aircraft in 2010, an annual increase of 2.9 percent, and the regional jet fleet from 206 aircraft in 1998 to 1,195 in 2010, an annual 15.8 percent increase.

The general aviation industry is picking up. In 1998, the industry had the highest number of shipments since 1994 -- 2,223 units, up from 1,159 units in 1997. The general aviation fleet is expected to increase from 194,800 in 1998, to 220,800 in 2010, a 1 percent yearly increase. The turboprop/turbojet fleet, the fastest growing segment, is forecast to increase 2.7 percent annually.

It is projected that aircraft operations handled at combined FAA and contract tower airports will increase from 50.9 million in 1999 to 63.9 million in 2010, an annual increase of 2.1 percent. To meet increasingly crowded skies, the agency last year advanced a focused safety agenda to reduce the rate of aviation accidents by 80 percent. In addition, the FAA has launched an aggressive air traffic modernization program that is expected to be fully implemented over the next decade.

Members of the public can contact FAA's Statistics and Forecast Branch at (202) 267-3355 to obtain a copy of FAA Aviation Forecasts Fiscal Years 1998-2010.

NAA Announces 1998 Most Memorable Flights

The National Aeronautic Association announced its annual list of the "Ten Most Memorable Record Flights," selected from more than 125 aviation world records set in the United States during 1998. "Humans have an innate desire to be the best," said Art Greenfield, NAA's Director of Contest & Records. "Nowhere is this more evident than in aviation, and specifically in these ten records."

NAA's selections for the "Top 10" record flights of 1998 are:

1. Remaining aloft for 14 hours and nine minutes, the Fuji blimp set a record for "Duration" as it provided television coverage of the U.S. Open Tennis Tournament in New York on September 6. The Fuji blimp, an Airship Industries Skyship 600, was manned by James Gross, John McHugh, Kenneth Petschow, and Mark Pinsky.

2. Two hundred forty-six skydivers, jumping out of 12 aircraft, joined together in formation during freefall over Ottawa, Illinois, on July 26. This earned the team a record for "Largest Formation."

3. Piloting a piston-engine radio controlled model airplane a distance of 808 miles over a racetrack course in Hagerstown, Maryland, Maynard S. Hill achieved a record for "Distance in a Closed Circuit." This record was set August 3.

4. A flight of 179 miles in a Firebird Cult paraglider earned Will Gadd a record for "Straight Distance" on May 30. The flight was made from Hobbs, New Mexico to Brice, Texas.

5. Flying a Bright Star Millennium, a rigid wing hang glider, Ramy Yanetz flew a distance of 251 miles, from Hobbs, New Mexico to Texline, Texas. This record for "Straight Distance" was set July 4.

6. United Airlines Captain R. Z. Blue and First Officer Edward R. Mieloch flew their Boeing 747-400 on a regularly scheduled commercial flight from Taipei, Taiwan, to San Francisco, California, in nine hours, 15 minutes, at a speed of 698 mph. This record for "Speed Over a Commercial Air Route" was set November 19.

7. Piloting a homebuilt Dominator Autogyro to a height of 24,463 feet earned Bill Clem a record for "Altitude without Payload." This record was set April 17 over Wauchula, Florida.

8. Flying a Woodstock I ultralight glider, Gary Osoba flew 315 miles, from Hutchison, Kansas, to Bonham, Texas, on April 21. This flight earned Mr. Osoba a record for "Distance."

9. At the controls of a Lockheed Martin ER-2, a NASA variant of the U-2, pilot James Barrilleaux held an altitude of 67,188 feet over Edwards Air Force Base in California. This record for "Altitude in Horizontal Flight" was set November 19.

10. Steve Fossett departed Mendoza, Argentina, on August 7, and flew his Rozier balloon "Solo Spirit" eastbound across the Southern Hemisphere. He covered 14,235 miles, earning a record for "Distance," before being brought down by a thunderstorm off the east coast of Australia on August 16.

(Editor's note: This was accomplished in 1998, before the recent around-the-world balloon flight, which will surely make the 1999 "top 10.")

The National Aeronautic Association is the National Aero Club of the United States and the nation's oldest aviation organization. Its primary mission is the advancement of the art, sport, and science of aviation and space flight. NAA is also the United States representative to the Federation Aeronautiquie Internationale, the organization that oversees all aviation and space records established worldwide.

Editor's Runway

from the pen of Phyllis-Anne Duncan

What's Next?

At first, nay-sayers proclaimed that it was impossible for humans to fly. They scoffed at Da Vinci's drawings of men with strapped-on wings or primitive helicopters. They ridiculed the idea of doing something only birds could do. The reasons why we supposedly couldn't fly were compelling for the times and certainly made those who longed to fly seem to be destined for Bedlam. But, in 1783 in the 18th Century in the midst of The Enlightenment, French balloonists proved that humans (after a rooster and a horse, I believe) could, indeed, travel assisted above the earth. In the 19th Century as the Industrial Revolution became the Industrial Era, gliders became the next major development in aviation. At the dawn of the 20th Century, in 1903, the Wright Brothers' first powered flight opened up an industry that continues to grow and which shows no signs of slowing down.

Even within aviation, after every step that was accomplished, so-called experts stepped up and said this will never be done, that will never be done, because of physics, because of the limits of the human body, because of the limits of manufacturing, ad infinitum. Whether it was crossing the English Channel by aircraft or the Atlantic or Pacific Oceans by aircraft, some pioneer proved the "experts" wrong. Perhaps they weren't wrong; maybe they simply lacked vision. And as every major, it-can-never-be-done aviation milestone was met and conquered, others were set up as a challenge.

A major news organization cooperated with cable television's "The History Channel" to broadcast this past April a program called "This Century." The program highlighted the major accomplishments of humankind from 1900 to 1999 and ran for 12 hours. Certain aviation accomplishments were a small part of the program, even though a series entitled "This Century in Aviation" might be a program which could take days to cover everything that aviation has contributed to civilization.

Consider that, in this century alone, aviation has grown from a few stumbling seconds of flight at Kill Devil Hills, NC to the prospect of regular, passenger-carrying rides to the edge of space and back. As a former historian, I can't think of any other enterprise which has made such cognitive and literal leaps in a mere 100 years. (Of course, we'll get letters with examples—the aforementioned Industrial Revolution is one—but that's part of why I make such statements.) Because aviation has grown with all the other incredible knowledge we have "discovered" in this century, we are now on the threshold of living in space and arriving there in flying machines of such sophistication that no one, except maybe H.G. Wells, could have envisioned in 1903.

And we'll get there because that pioneering spirit is as strong in aviation as can be found anywhere. The most recent it-will-never-be-done accomplishment is a perfect example of that. Many teams and individuals have tried for decades to fly a balloon around the world. The launches had occurred to much cheering and great hopefulness, only to have hopes dashed by premature landings, some so tantalizingly close to the goal. Some gave up, but others persisted, and that dogged human perseverance—some might call it stubbornness—paid off in March when Bertrand Piccard and Brian Jones landed in Egypt after a trip that took them around the world in 20 days.

(As a Star Trek™ fan, I'm absolutely beside myself that one of the balloonists is a Piccard, an ancestor, I'm certain, of that intrepid galactic explorer, Capt. Jean-Luc Picard.)

Since that record-breaking flight, there has been a great deal of speculation on what's next to break. Some have even referred to the flight as "the last major aviation record." I disagree. This was a two-person flight, after all. A solo, around-the-world balloon flight would be a completely different endeavor. What is universal about aviation is that true aviation pioneers take "It can't be done" as a challenge to show that whatever "it" is can and will be done.

It could be, however, that what's next simply hasn't occurred to anyone yet. It could be a dream in the mind of a child who looks up at the overhead noise of an aircraft and wonders about pushing the limits of what is currently accepted science and who doesn't let the nay-sayers discourage him or her from trying to push those limits a bit further out. An illustration of this is a young scientist who grew up on science fiction's "ion engines" for propulsion between planets. Everyone said there can possibly be no such thing as an "ion engine;" it's a physical impossibility. What did that young scientist do? He grew up, designed an theoretical ion engine on paper, then had an ion-engine powered spacecraft launched last year on a test flight. For a few weeks, the impossible ion engine functioned in space. Pioneers in aviation also show that same unwillingness to take "it can't be done" as a showstopper.

So, what's next in aviation?

Anything that human creativity can get its thoughts into and that human imagination can conceive. Even the sky, anymore, is no limit.

'Til next time...

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